1. Graph the following function. Identify the domain, range, and asymptotes of f.

$$f(x) = -5^{x+1} + 2.$$

2. Compute the following values.

a) $\log_3(243)$ b) $\log_7\left(\frac{1}{49}\right)$ c) $\ln\left(\frac{1}{e}\right)$ d) $\log_{\frac{1}{7}}(343)$

3. Graph the following function and identify the domain, range, and asymptotes of f:

$$f(x) = \log_{\frac{1}{2}}(-x-2)+2.$$

4. Solve the following equations.

a) $5^x - 10 = 0$

b) $4^x - \left(\frac{1}{16}\right)^{x+1} = 0$

c) $\log_3(-x-1) - \log_3(-x+12) = -2$

5. Take a and b to be two real numbers so that $\log_5(a) = 5$ and $\log_5(b) = -4$. Compute the following.

a) $\log_5(25ab)$

b) $\log_5(\frac{a^3}{5b^4})$

6. A quantity A changes according to a linear model for change and

$$\begin{cases} A(0) = 4 \\ A(1) = 13. \end{cases}$$

Identify a formula for $A(t)$.

7. A quantity A changes according to an exponential model for change and

$$\begin{cases} A(2) = 10 \\ A(5) = 9. \end{cases}$$

Identify a formula for $A(t)$.

8. A mass of bacteria experiences exponential growth. At time 3 an experimenter has 30 grams of bacteria. At time 7, the mass has grown to a mass of 50.

a) Determine the doubling time of the bacteria.

b) Determine the time that it takes for the amount of the material to increase by a factor of 3.

c) Determine the growth rate of the substance.